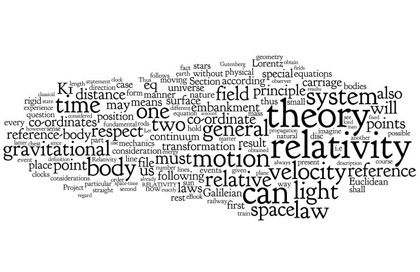
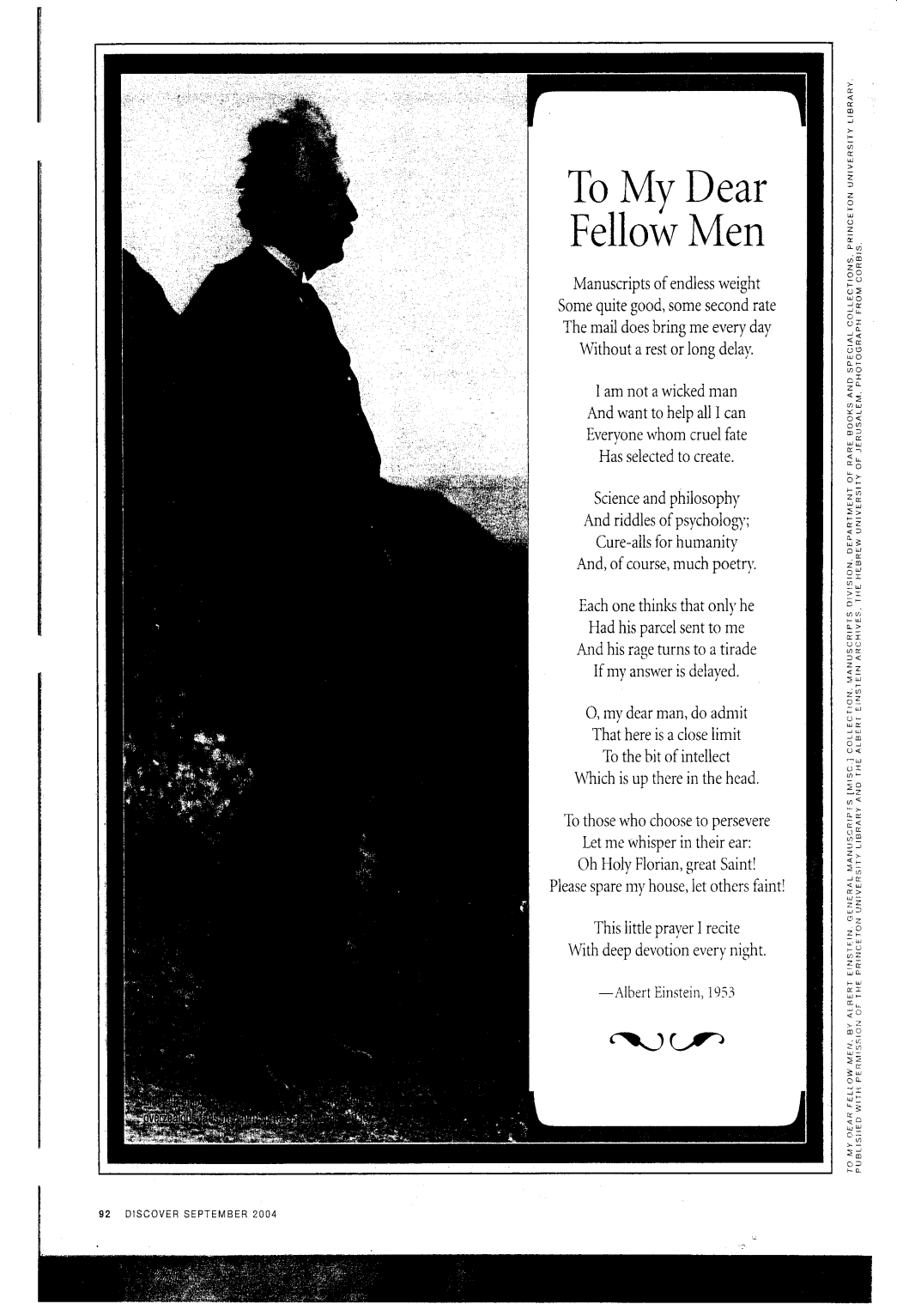
**Physics in Time:**

An investigation into Time and Relativity



A Thought Experiment

Created By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



This journal is a portfolio of your own thought experiments as we investigate the physics in time.

On the following pages are quotes and ideas related to our topic. Throughout our learning journey you will be assigned to reflect and comment on some of these ideas.

We may not go in order, and you may not be assigned to respond to each reflection.

**Reflection Response**

1

**What would it be like to ride a beam of light?**

**Reflection Response**

2

**What is Time?**

The shadow on the dial,

The striking of the clock,

Running of the sand, day and night,

Summer and winter, months, years, centuries-

Are but arbitrary and outward signs,

The measure of Time, not time itself.

Time is the light of the soul.

-Henry Wadsworth Longfellow

**What is Time?**

**Reflection Response**

**Reflection Response**

3

**Reflections on Time**

People I know who are always on time are\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because

My best working time is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because

Other people say my use of time is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because

Are you a “morning” or “night” person? Why do you believe this to be true?

4

Read the list of time phrases below. Then, add to it….



In the nick of time

Time flies

Time marches on

Time on my hands

A stitch in time saves nine

Time out

Doing time

On time

For the time being

From time to time

Once upon a time

The time of your life

13.

14.

15.

16.

17.

18.

19.

20.

**Reflection Response**

**Reflection Response**

5

“Time is at the heart of all that is important to human beings.”

~Bernard D’Espagnat

Explain this statement. What is the meaning of the word “heart” as it is used in this quote? Do you agree or disagree with this viewpoint? Give reasons to support your opinion.

6

“When a day passes, it is no longer there. What remains of it? Nothing more than a story. If stories weren’t told or books weren’t written, man would live like the beasts, only for a Day.”

Naftali the Storyteller and His Horse, Sus

~Isaac Bashevis Singer, 1973

Explain this statement. Do you agree or disagree with this viewpoint? Give reasons to support your opinion

**Reflection Response**

**Reflection Response**

7

“I create time or time creates me.”

Explain this statement. Do you agree or disagree with this viewpoint? Give reasons to support your opinion.

8

“Is time a line or a circle?”

Explain this statement. To which side do you agree, and to which do you disagree? Give reasons to support your opinion.

**Reflection Response**

**Reflection Response**

9

**On The Relativity of Time**

Why did Chronos refer to the pond as a mirage?

From Chronos’ perspective what causes the spirals in the sky?

Describe the importance of humans from the perspective of Chronos.

Other thoughts????

**Below is a passage describing time. Read the selection. At the bottom of the page, describe how time can be the five senses by giving your own examples.**

Ray Bradbury wrote a beautifully poetic passage about the mystery of time in “Night Meeting,” one of the splendid sub-stories in his episodic masterpiece *The Martian Chronicles*. A modern man of A.D. 2002, who is one of the modern inhabitants of Mars, somehow meets the ghostly image of a long-dead Martian on cold August night. The conditions are just right for such a cross-time encounter. As the man thinks to himself, “There was a smell of Time in the air tonight. He smiled and turned the fancy in his mind. There was a thought. What did time smell like? Like dust and clocks and people. And if you wondered what Time sounded like it sounded like water running in a dark cave and voices crying and dirt dropping down upon hollow box lids, and rain. And, going further, what did Time look like? Time looked like snow dropping silently into a black room or it looked like a silent film in an ancient theater, one hundred billion faces falling like those New Years balloons, down and down on nothing. That was how Time smelled and looked and sounded. And tonight….tonight you could almost touch Time.”

Time as Sight:

Time as Sound:

Time as Smell:

Time as Touch:

Time as Taste:

**Reflection Response**

**Reflection Response**

11

**Reflections on Speed of Light**

The Speed of light is:

…”five more minutes, mom” when you are sleeping in the morning.

… the time spent on recess each day.

… the speed the day goes when you have something to do after school that you are dreading.

… the speed of summer and the anti-speed of the school year.

Complete the phrase **The speed of light is**….

1)

2)

3)

4)

5)

**Reflection Response**

**Reflection Response**

*A Theory of Everything* and Newton’s *Embarrassing Secret*

Explain how Einstein's goal of combining the physical laws of the universe into one theory that explains it all is the Holy Grail of modern physics.

*A New Picture of Gravity* and *A Strange New World*

How do you experience the force of gravity?

**Reflection Response**

**Reflection Response**

*The Quantum Cafe* and *Gravity, The Odd-Man Out*

Explain how the world is a game of chance.

*Strings to the Rescue* and *Science or Philosophy*

String theorists have a problem: strings, if they exist, are so small that there's little hope of ever seeing one, **so how can the theory be tested?**

**Reflection Response**

**Reflection Response**

*Two Conflicting Sets of Laws* and *One Master Equation*

After watching these segments, what are you thinking?

*The Birth of String Theory, The Standard Model* and *Wrestling with String Theory*

Describe the evolution of String Theory

**Reflection Response**

**Reflection Response**

*The Theory of Everything, Multiple Dimensions* and *Five Flavors of String Theory*

String Theory, a theory of everything or a theory of nothing. Explain.

*The Wild West of Physics* and *The Potential of Strings*

What if extra dimensions, rips in the fabric of space, and parallel universes actually exist?

**Reflection Response**

**Reflection Response**

*Getting to One Theory, Parallel Universes* and *Escaping Gravity*

String Theory requires a universe with more than four space/time dimensions. Where may these other dimensions exist?

*Signs of Strings* and *Too Elegant to be Wrong*

What are some current ideas in science today that seem improbable?

Some scientific ideas that seemed improbable in the past: Earth being round, the sun being at the center of the solar system, continental plate movement, landing a man on the moon

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